



VISHAY VITRAMON

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Ceramic Capacitors

Tech Note TN-0029

Vishay Vitramon MLCC End Termination

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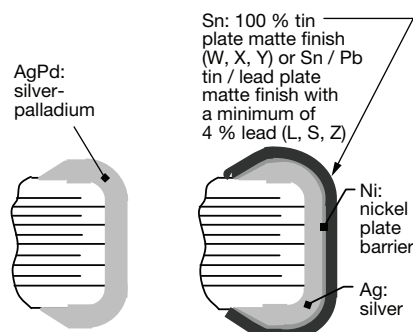


Figure 1
Termination codes: F, M, E

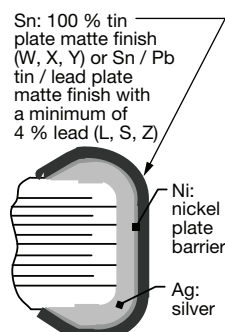


Figure 2
Termination codes: L, S, W, X, Y, Z

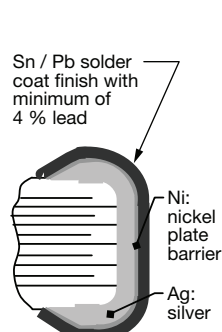


Figure 3
Termination code: U

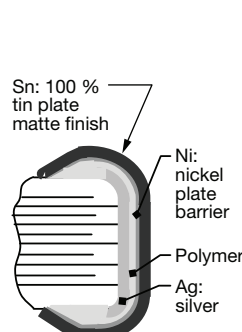


Figure 4
Termination code: B, W

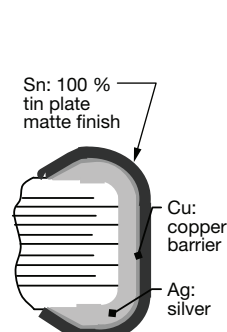


Figure 5
Termination code: C

TERMINATION CODE FROM PART NUMBERING	TERMINATION DEFINITION	ACCEPTED ASSEMBLY METHODS
F, M ⁽³⁾	Fired, thick film, silver / palladium (higher palladium content) ⁽⁸⁾	Conductive epoxy
E ⁽²⁾	Fired, thick film, silver / palladium (lower palladium content)	Conductive epoxy
C ⁽⁶⁾	Copper with an outer layer of 100 % tin plate matte finish for multi-solder mounting	Wave solder ⁽¹⁾ / reflow solder / vapor phase reflow
W ⁽³⁾ , X, Y ⁽³⁾	Fired, thick film silver, covered by 100 % nickel barrier plate with an outer layer of 100 % tin plate matte finish for multi-solder mounting	Wave solder ⁽¹⁾ / reflow solder / vapor phase reflow
L, S ⁽⁷⁾ , Z ⁽³⁾	Fired, thick film silver, cover by 100 % nickel barrier plate with an outer layer of tin / lead plate matte finish with a minimum of 4 % lead for multi-solder mounting	Wave solder ⁽¹⁾ / reflow solder / vapor phase reflow
U ⁽⁴⁾	Fired, thick film silver, cover by 100 % nickel barrier plate with an outer layer of tin / lead plate finish matte with a minimum of 4 % lead for solder coat	Wave solder ⁽¹⁾ / reflow solder / vapor phase reflow
B	Fired, thick film silver, cured thick film polymer silver, covered by 100 % nickel barrier plate with an outer layer of 100 % tin plate matte finish for multi-solder mounting	Wave solder ⁽¹⁾ / reflow solder / vapor phase reflow
W ⁽⁵⁾	Fired, thick film silver, cured thick film polymer silver, covered by 100 % nickel barrier plate with an outer layer of 100 % tin plate matte finish for multi-solder mounting and improved bending capability performance	Wave solder ⁽¹⁾ / reflow solder / vapor phase reflow

Notes

- (1) Case sizes 1111, 1206, 1210 to 1812 with a thickness > 0.049" (1.24 mm) and case sizes 1825 and larger should NOT be wave soldered
- (2) Termination code "E" is for conductive epoxy assembly, contact mlcc@vishay.com for availability
- (3) Code in CDR and MIL-PRF-123 part numbers only
- (4) CDR "U" termination code: Base metallization-barrier metal-solder coated (tin/lead alloy, with a minimum of 4 % lead). Solder has a melting point of + 200 °C or less. Solder coat thickness is a minimum of 60 microinches.
 - Solder iron techniques are not recommended. For more information on soldering visit www.vishay.com/doc?45034
 - Contact mlcc@vishay.com with respect to specific part number requirements
- (5) Code in safety, commercial, and automotive part numbers only
- (6) For "C" termination solder coverage should be at least 90 % of the terminal critical areas in soldering
- (7) MIL-PRF-123 part numbers only
- (8) Higher palladium content helps to stabilize the silver in the termination and significantly reduces the tendency for silver migration. The denser termination layer enhances the mechanical strength of the termination



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MLCC END TERMINATION PHYSICAL CHARACTERISTICS							
P/N TERM CODE	THICK FILM END TERMINATION		BARRIER TERMINATION	TERMINATION FINISH			
	MATERIAL	THICKNESS (INCHES)	Ni PLATE THICKNESS (MICROINCHES)	Sn PLATE THICKNESS (MICROINCHES)	Sn/Pb PLATE THICKNESS (MICROINCHES)	Sn/Pb SOLDER COAT THICKNESS (MICROINCHES)	CONTENT OF LEAD
F, M	Ag / Pd	0.001 min.	n/a	n/a	n/a	n/a	n/a
E	Ag / Pd	0.001 min.	n/a	n/a	n/a	n/a	n/a
C	Ag	0.001 min.	n/a	100 min.	n/a	n/a	n/a
W ⁽¹⁾ , X, Y	Ag	0.001 min.	50 min.	100 min.	n/a	n/a	n/a
L, S, Z	Ag	0.001 min.	50 min.	n/a	100 min.	n/a	4 % min.
U	Ag	0.001 min.	50 min.	n/a	n/a	60 min.	4 % min.
B, W ⁽²⁾	Polymer	0.003 min.	50 min.	100 min.	n/a	n/a	n/a

Notes

- Element definition: Ag = silver, Pd = palladium, Ni = nickel, Sn = tin, Pb = lead
- n/a = not applicable
- ⁽¹⁾ Code in CDR and MIL-PRF-123 part numbers only
- ⁽²⁾ Code in safety, commercial, and automotive part numbers only